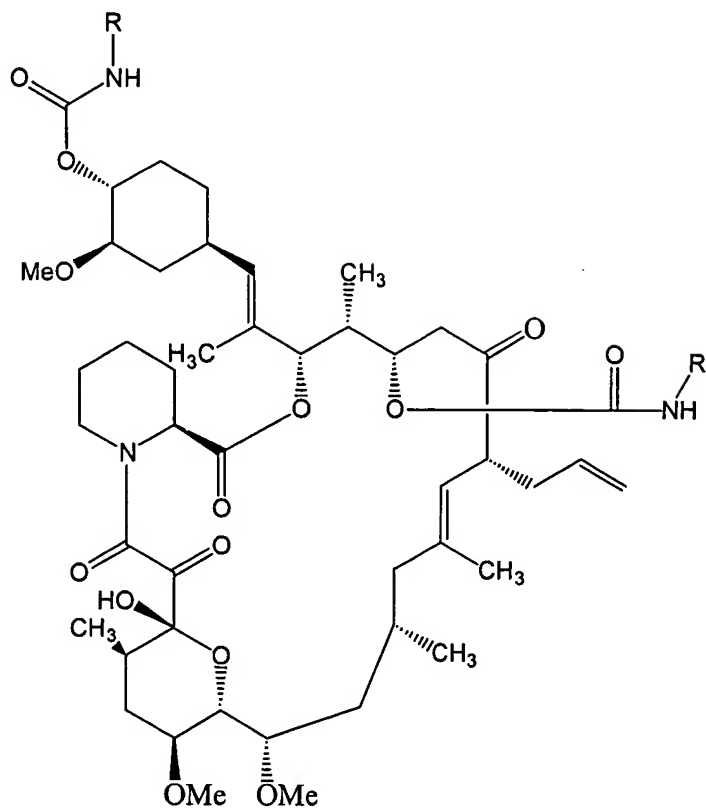


Claims:

1. A compound having the formula:



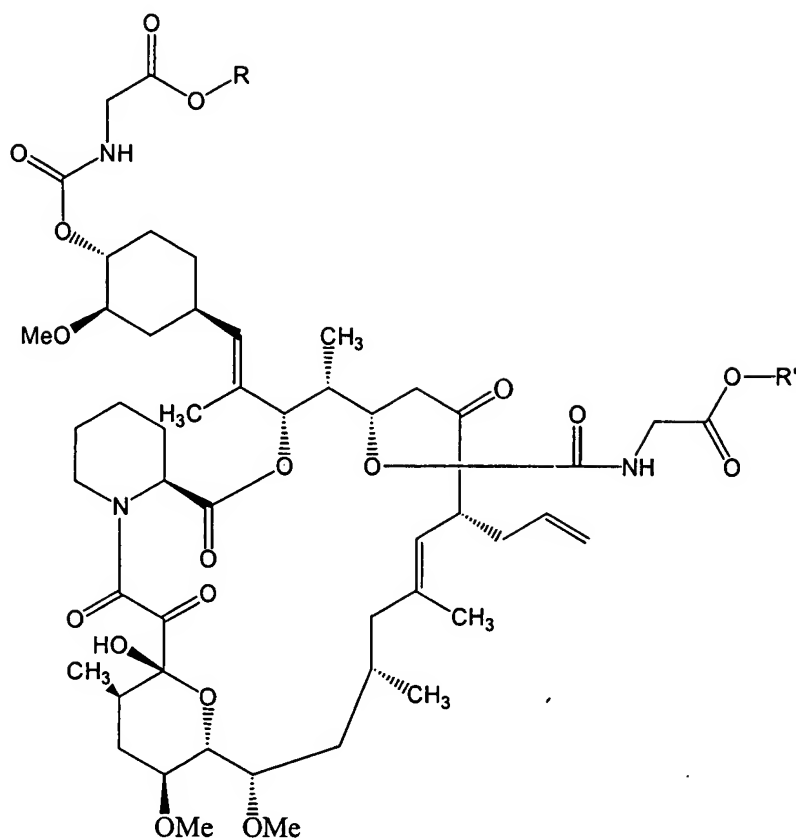
or solvate thereof,

R is alkyl, aryl, or allyl, each having less than 25 carbons and wherein

R' is alkyl, aryl, allyl, each having less than 25 carbons or H.

2. The compound of claim 1 wherein R or R' further comprise at least one functional group selected from the group consisting of esters, ethers, amides, phosphates, sulfonates, sulfate, amidines, phosphonates, or carboxylate functional groups.

3. A compound having the formula:



or solvate thereof, wherein

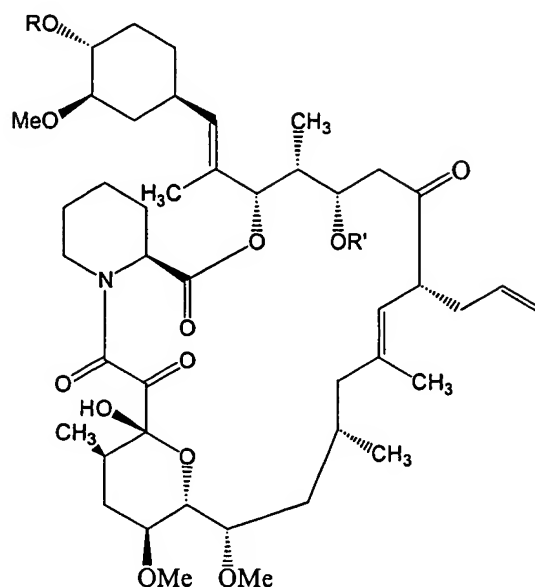
R is alkyl, aryl, or allyl, each having less than 25 carbons and

R' is alkyl, aryl, allyl, each having less than 25 carbons or H.

4. The compound of claim 3 wherein R or R' further comprise at least one functional group selected from the group consisting of esters, ethers, amides, phosphates, sulfonates, sulfate, amidines, phosphonates, amine, hydroxyl, or carboxylate functional groups.

5. The compound of claim 3 wherein R or R' is ethyl.

6. An assay reagent comprising an effective amount of



wherein R is an alkyl, aryl, allyl, carbonyl, carboxylate, amide, ester, phosphonate, phosphate, sulfonate, sulfate, amidine, carbamate; and R' is an alkyl, aryl, allyl, carbonyl, carboxylate, amide, ester, phosphonate, phosphate, sulfonate, sulfate, amidine, carbamate, or H.

7. A method of determining the presence of a macrophilin-binding pharmaceutical composition in a sample comprising: adding a binding competitor of the formula of claim 1 to the sample; adding a receptor that binds to the pharmaceutical but not significantly to the binding competitor; detecting the receptor-pharmaceutical composition and determining the amount of the pharmaceutical.

8. The method of claim 7 wherein the pharmaceutical is rapamycin (sirolimus), everolimus or tacrolimus (FK506).

9. A method of determining the presence of a macrophilin-binding pharmaceutical composition in a sample comprising: adding a binding competitor of the formula of claim 3 to the sample; adding a receptor that binds to the pharmaceutical but not significantly to the binding competitor; detecting the receptor-pharmaceutical composition and determining the amount of the pharmaceutical.
10. The method of claim 9 wherein the pharmaceutical is rapamycin (sirolimus), everolimus or tacrolimus (FK506).
11. The method of claim 10 wherein R or R' is ethyl.
12. A method of determining the presence of a macrophilin-binding pharmaceutical composition in a sample comprising: adding a binding competitor of the formula of claim 6 to the sample; adding a receptor that binds to the pharmaceutical but not significantly to the binding competitor; detecting the receptor-pharmaceutical composition and determining the amount of the pharmaceutical.
13. The method of claim 12 wherein the pharmaceutical is rapamycin, (sirolimus), everolimus or tacrolimus (FK506).